

Claims

- [c1] A device, comprising:
an active region including a collector region;
an oxide layer formed over the collector region and having a conductive pathway in electrical contact with the collector region; and
a collector metal contact deposited over the oxide layer and the conductive pathway; wherein the conductive pathway through the oxide layer provides electrical contact between the collector metal contact and the collector region.
- [c2] The structure of claim 1, wherein the active region includes an emitter region, a base region deposited on a top surface of the emitter region, and the collector region deposited on a top surface of the base region.
- [c3] The structure of claim 1, further comprising a passivation layer deposited about the emitter region and about the base region, and a second oxide layer deposited around a side of the collector region and in contact with the oxide layer.
- [c4] The structure of claim 1, wherein the conductive pathway

through the oxide layer from the collector metal contact to the collector region comprises a vertical conductive pathway.

[c5] The structure of claim 1, wherein the conductive pathway through the oxide layer from the collector metal contact to the collector region comprises of metal filled via.

[c6] The structure of claim 1, further comprising a silicide layer disposed between the surface of the collector region and the oxide layer.

[c7] The structure of claim 1, wherein the conductive pathway to the collector region comprises a base metal contact disposed on the top of the oxide layer.

[c8] The structure of claim 7, further comprising a further conductive pathway to at least one of the base region and the emitter region.

[c9] The structure of claim 8, wherein the further conductive pathway includes a first conductive pathway and a second conductive pathway, wherein the first conductive pathway comprises filled vias formed in the oxide layer, the second oxide layer and the passivation layer and between metal contacts and the emitter region, wherein the second conductive pathway includes a filled via formed in the oxide layer and the second oxide layer and be-

tween a metal contact and the base region.

- [c10] The structure of claim 8, wherein the first conductive pathway is formed in the oxide layer, the second oxide and the passivation layer.
- [c11] The structure of claim 10, wherein the first conductive pathway includes filled vias formed in the oxide layer and the second oxide layer and the passivation layer, and between metal contacts and the emitter region, wherein the second conductive pathway includes a filled via formed in the oxide layer and the second oxide layer and between a metal contact and the base region.
- [c12] The structure of claim 10, wherein the second conductive pathway includes filled vias disposed within the oxide layer and the second oxide layer between a base metal contact and the base region and the emitter region.
- [c13] A semiconductor device, comprising:
 - an emitter region;
 - a base region laying on a surface of the emitter region;
 - a passivation layer deposited about the emitter region and about an edge of the base region;
 - a collector region laying on the base region and electrically isolated from a substrate; and

an oxide layer deposited about at least one side and on a surface of the collector region.

[c14] The semiconductor device of claim 13, further comprising:

a conductive pathway to the collector region within a portion of the oxide layer formed on top of the collector region; and

a metal contact formed on the oxide layer and the conductive pathway to provide electrical contact to the collector region.

[c15] The semiconductor device of claim 14, further comprising a conductive pathway to the base region through the passivation layer.

[c16] The semiconductor device of claim 15, wherein the conductive pathway to the base region comprises a base metal contact on a top of the oxide layer and a filled via through the oxide layer between a base metal contact and the extrinsic base region.

[c17] The semiconductor device of claim 13, further comprising a conductive pathway to the emitter region including a conductive pathway through the oxide layer and the passivation layer.

[c18] The semiconductor device of claim 13, wherein the oxide

layer comprises a first oxide layer deposited about at least one side of the collector region and a second oxide layer deposited on a top surface of the collector region.

- [c19] A method of fabricating a device, comprising:
depositing a base layer on a first side of a collector layer;
depositing an emitter layer on the base layer;
depositing a first oxide layer on a second side of the collector layer;
etching a via through the first oxide layer from a top surface of the first oxide layer to the second side of the collector layer; and
filling the via with a conductor to form an electrical pathway to the collector through the first oxide layer.
- [c20] The method of claim 19, further comprising forming an electrical pathway to the emitter layer, and forming an electrical pathway to the base layer.
- [c21] The method of claim 19, further comprising depositing a silicide layer between the second side of the collector layer and the first oxide layer, wherein the via is etched through the first oxide layer from a top surface of the first oxide layer to the silicide layer.
- [c22] The method of claim 21, further comprising forming metal contacts on a passivation layer, the oxide layer,

and the base and emitter layers.

[c23] The method of claim 21, further comprising forming a via through the second oxide layer to the base layer.

[c24] The method of claim 19, further comprising:
bonding a second side of the collector layer to a first substrate prior to the deposition of the first oxide layer;
prior to the bonding step depositing an oxide layer around at least one side of the collector layer;
depositing a passivation layer on the oxide layer and base layer and emitter layer; and
depositing at least one metal contact on the passivation layer and bonding the at least one metal contact to a substrate and removing at least a portion of the first substrate.

[c25] The method of claim 24, further comprising forming a conductive pathway between the metal contact and the base by forming a via through the first oxide layer and the second oxide layer.

[c26] The method of claim 19, further comprising forming a substrate which is electrically isolate from the collector region.